NORTH DAKOTA
DEPARTMENT OF HEALTH

Division of Air Quality

RADIOACTIVE MATERIAL
LICENSING GUIDE

Industrial Radiography

Revised February 2, 2006

Contents

I. INTRODUCTION

The purpose of this guide is to provide guidance in the preparation of an application for a North Dakota Department of Health Radioactive Material License for possession and use of sealed sources and devices for performance of industrial radiography.

Radiography, as used in this guide, means "the examination of the structure of materials by nondestructive methods, utilizing sealed sources of radioactive material." The radioisotopes (radioactive materials) most commonly used for radiography are Cobalt-60 and Iridium-192.

This licensing guide should provide an understanding of specific regulatory requirements and licensing policies as they apply to industrial radiography. The information in this guide is not a substitute for training in radiation safety or for the requirements contained in the North Dakota Radiological Health Rules.

After becoming licensed, the licensee must conduct its program in accordance with (1) the statements, representations, and procedures contained in the application, (2) the terms and conditions of the license, and (3) the North Dakota State Radiological Health Rules.

All information submitted as part of this application will be subject to North Dakota's Open Record Statute, Section 44-04-18, "Access to Public Records - Penalty" of the North Dakota Century Code. The information will be available to the public unless confidentiality is granted by the department. Requests for confidentiality must be submitted in accordance with Section 23-20.1-09.1, "Confidentiality of Records" of the North Dakota Century Code. Confidentiality requests will be considered in accordance with the above mentioned statutes.

II. FILING AN APPLICATION

The information submitted must be sufficient to allow the Department to determine that the proposed equipment, facilities, procedures, and controls are adequate to protect health and minimize danger to life and property. Information submitted should pertain to the specific activities for which authorization is sought and should be complete. Submission of incomplete information will result in delays because of the correspondence necessary to obtain supplemental information. Applications should be mailed to:

North Dakota Department of Health
Division of Air Quality
918 East Divide Avenue, 2nd Floor
Bismarck, North Dakota 58501-1947
Phone: 701-328-5188
Fax: 701-328-5185

Since licensees are required to comply with Department rules, license conditions, and the content of the submitted application, at least one copy of all information submitted to the Department should be kept by the applicant for reference.

III. RADIOACTIVE MATERIAL LICENSE APPLICATION FORM SFN 8418

The application (SFN 8414) should be completed following the instructions provided with the form. The signed original copy should be filed with the Department and one copy kept by the applicant. Since the space provided on the form is limited, additional sheets should be appended as necessary. Supplemental information should be labeled to identify the applicant and should reference the item for which information is being given. The following comments deal with the indicated items:

Item 1: Applicant and Locations of Use - The application corporation or other legal entity should be specified by name and mailing address in Item 1(a). Individuals should be designated as the

applicant only if they are acting in a private capacity and the use of radioactive material is not connected with their employment with a corporation or other legal entity.

The actual sites of use should be given in 1(b). Permanent facilities such as field office storage areas for the gauges or devices should be identified in 1(b) by street address, city, and state.

Item 4: Personnel

Each person who will use radioactive material shall be named and designated as either a radiographer assistant or a radiographer. Radiographer assistants may manipulate radiographic equipment only under the direct personal supervision of an experienced radiographer.

Item 5: Radiation Safety Officer

The individual designated as radiation safety officer (RSO) shall be identified and a detailed description of his duties and responsibilities shall be provided. (The RSO is the individual who will coordinate and have overall responsibility for the radiation safety program.) The following list describes typical duties to be performed or coordinated by the RSO. The list is not intended to be all inclusive nor should it be interpreted as a requirement that any one person perform all of the listed duties. Specific information pertaining to your program should be submitted.

1. Serve as a licensee's liaison officer with the North Dakota Department of Health on license matters.
2. Maintain control of procurement and disposal of licensed material.
3. Develop and maintain up-to-date operating and emergency procedures.
4. Establish and maintain a personnel monitoring program.
5. Procure and maintain radiation survey instruments.
6. Establish and conduct the training program for radiographers and radiographers' assistants.
7. Examine and determine competency of radiographic personnel.
8. Establish and maintain storage facilities.
9. Maintain exposure devices, radiography facilities, and associated equipment.
10. Establish and maintain the leak testing program.
11. Establish and maintain the internal inspection system.
12. Perform source replacement and source tagging operations.
13. Conduct quarterly inventories and maintain utilization logs.
14. Establish and conduct a survey instrument calibration program.
15. Establish and maintain the licensee's record keeping system.
16. Review and ensure maintenance of those records not kept directly by the RSO.
17. Assume control and institute corrective action in emergency situations.
18. Investigate the cause of incidents and determine necessary preventive action.

19. Act in advisory capacity to licensee's management and radiography personnel.

If a consultant is the radiation safety officer and is not available on a full-time basis, you must identify the individual that is available to oversee the program on a day-to-day basis.

Item 6: Materials

The sealed sources which the applicant wishes to possess and use must be listed by radioisotope, manufacturer, and model number. The maximum amount of radioactivity in each source shall be specified. The maximum number of sources which the applicant desires to possess at any one time shall be stated.

Item 7: Uses

The radiographic exposure devices (cameras) in which the sources will be used shall be designated by the manufacturer and model number. The sources identified in Item 6 must be keyed to the devices in which they will be used.

If source changers will be used, the source changers must be identified by manufacturer and model number and must be keyed to the source-device combinations with which they will be used. This information is available from the manufacturer.

Items 8 and 9: Training and Experience of Each Individual

Items 8 and 9 must be completed for each individual named in Items 4 and 5 of the application form. Use separate appended sheets for each user. Also describe the training and experience of the radiation safety officer.

Training Program

The information necessary in a description of a training program is specified below:

A. Narrative Description

A narrative of your complete training program, including appropriate reference to any instruction to be given by outside service organizations should be included.

Such a narrative shall describe, in general terms, the sequence of events in the training of a person to become a radiographer or radiographer assistant from the time the person is hired through the time the person goes on the job as a radiographer or a radiographer assistant.

Since the requirements of subsection 33-10-05-05.3 of the rules are different for radiographers and radiographer assistants, it may be desirable to submit a separate narrative pertaining to the training of individuals to be radiographers, and radiographer assistants. In addition, a third narrative pertaining to the training of individuals who are hired with previous training and experience may also be desirable.

B. Initial ("Classroom") Training

A description of the manner in which radiographer assistants will be instructed in all areas of Section 33-10-05-05 of the rules, Appendix A should be submitted.

A description of this part of your course should include a detailed outline (more detailed than Section 33-10-05-05, Appendix A) of the course content including specification of the approximate time to be spent on each major area of instruction.

If individuals are to be trained to be radiographer assistants, that training program should be described.

Note: A training course given by an outside service organization usually will not instruct the assistant with respect to your particular equipment, facilities, and procedures. Therefore, if you plan to utilize such training, you shall describe the instruction to be given to each assistant with respect to your own equipment, facilities, and procedures, and the assistant's knowledge and competency in accordance with subsection 33-10-05-05.3 of the rules.

C. On-the-Job Training

A period of training of at least two months as a radiographer assistant including observation of the use of radiographic exposure devices and associated equipment, by an experienced radiographer and the assistant's use of such equipment under the supervision of the radiographer shall be described.

The content of on-the-job training shall be specified.

D. Training of Experienced Radiographers and Radiographer Assistants

Due to differences in procedures, equipment, etc., it is unlikely that a new employee will be adequately prepared to work in your program without some training. Also, each licensee is required by subsection 33-10-05-05.3 of the rules to make a determination that each individual is qualified to act as a radiographer or radiographer assistant in its program. You shall, therefore, describe your procedure for determining the knowledge and competency of such individuals and for providing additional training, if needed.

E. Periodic ("Refresher") Training

This shall include a description of the content and scheduling of your training sessions given for the purpose of assuring:

1. The knowledge and proficiency of radiographers and radiographer assistants with respect to new rules, procedures, policies, and equipment and procedures.

2. Continuing proficiency with present equipment and procedures.

It is required by subdivision 33-10-05-05.3(c) of the rules that such refresher training be conducted at least annually.

F. Testing Procedures

You shall submit a description of each test to be given.

A description of a written test may be given by submitting a sample test with an answer for each question.

The effectiveness of any test is reduced if given repeatedly so that the students gain knowledge of its content. Your should clearly indicate in your course description that each test is a sample only, that the test will be changed periodically, and give a minimum frequency at which the test will be altered.

A description of an oral examination shall be given in the same form as a written examination.

Practical or on-the-job demonstration examination procedures may be described in terms of the areas of performance to be checked by the examiner such as performance of radiation surveys, posting, and operation of equipment.

A description of the testing procedure is not complete without a clear and specific description of the criteria and procedure to be followed in evaluating test results and determining whether an individual is qualified to act as a radiographer or radiographer assistant. The relative importance assigned to each question or area of performance, the minimum acceptable number of correct answers or proper responses, and retesting procedures shall be provided.

The points within the training program at which each test will be given shall be clearly indicated. For example, some training programs include a written or oral exam following the "initial" training phase, followed by an oral and practical exam at the close of the on-the-job training phase.

Note that testing procedures must assure compliance with subsection 33-10-05-05.3 of the rules.

G. Radiographer's Qualifications

The name and training and experience with radiation of each person who is to participate in the instruction, examination, or qualification of assistants shall be given in sufficient detail to establish his or her qualifications to perform this service. If an individual will only teach certain parts of the course, this must be specified.

The person who makes the final determination of the adequacy of a assistant's knowledge and competency must have a strong background of training and experience with radiation and be a radiographer. On-the-job training shall be given by an experienced radiographer.

H. Records

Confirmation shall be given that you will maintain a copy of tests given to each assistant and records showing assistant performance in each exam, including oral and practical exams, and the examiner's overall evaluation of the assistant as qualified to act as a radiographer or radiographer assistant.

With respect to radiography personnel, three important points should be understood:

1. Only a radiographer or a radiographer assistant under direct supervision of a radiographer may manipulate radiographic exposure devices, sealed sources, related handling tools, or survey instruments.

2. Any individual acting in the capacity of a radiographer assistant must meet the requirements of subdivision 33-10-05-05.3(a) of the rules.

3. Any individual acting in the capacity of an experienced radiographer must be a qualified radiographer with one year of documented experience and may even be named as a radiographer on the license.

In certain cases where a radiography program is limited to a few individuals and personnel turnover is not anticipated, a training program may not be necessary provided each individual has adequate training and experience. In such a situation, your application shall request that specific individuals be named on the license in lieu of submitting details of a complete training program. The qualifications of each individual designated as a radiographer or radiographer assistant shall be described and should include the following information:

1. The individual's name and capacity in which he will function (radiographer or radiographer assistant).

2. A detailed description of each individual's training and experience in the principles of radiation and radiation safety. The information provided shall specify when (dates)

and where training was received. The name of the individual who provided the training shall be indicated if the training was other than at a commercially offered training program.

3. The specific experience of each individual in the use and handling of the type of equipment listed in your application. The information shall include previous work history including names of previous employers, when employed, type of equipment used, and length of time the equipment was used for each previous employer.

4. A description of the instruction that each prospective radiographer and radiographer assistant has received in your operating and emergency procedures.

5. A description of the means used to determine competency of individuals to act as radiographers and by whom such determination is made. Copies of examinations given to determine knowledge and understanding of the topics in subdivision 33-10-03-05.3 of the rules, your operating and emergency procedures, and use of equipment should be submitted.

6. A description of the means used to determine competency of individuals to act as radiographer assistants and by whom such determination is made. Copies of examinations given to determine understanding of your operating and emergency procedures and means used to determine competency to use radiographic and related equipment should be submitted.

7. A description of your periodic "refresher" training program for personnel.

The limitations imposed in licenses when the applicant has not established a complete program for training radiographers and radiographer assistants shall be clearly understood. The license will specifically name each individual authorized to act as a radiographer or radiographer assistant. Should all radiographers who are named in the license become unavailable because of sickness, vacation, or any other reason, the licensee is not permitted to perform radiography under the license, and therefore, has, in effect, authorization to possess the licensed radioactive material for storage purposes only. The individuals named on the license are required to perform all radiographic operations conducted under the license, including the manipulation of equipment and the performance of radiation surveys. Although application may be made for the addition or substitution of names of other individuals in the license, the time needed for preparation and submission of the application and for the Department to issue an amendment could delay your program. No individual may act as a radiographer assistant unless the license is amended to provide for an individual to act in that capacity.

Item 10: Description of Radiation Detection Instruments to be Used

Detection instruments must be identified by manufacturer, model number, and range of instrument. For instruments to be used for surveys, the instruments must have a capability of measuring a range of two milliroentgen per hour through one roentgen per hour.

Item 11: Instrument Calibration Procedures

Subsection 33-10-05-04.4 of the rules requires that radiation survey instruments used in radiographic operations be calibrated at intervals not to exceed six months and after each instrument servicing. To properly calibrate a survey instrument, its response must be checked at two points located approximately one-third and two-thirds of full scale on each scale for linear scale instruments, at midrange of each decade, and at two points of at least one decade for logarithmic scale instruments and at appropriate points for digital instruments. If the instrument's readings correspond to calculated values within the range of ± 10%, the instrument may be considered properly calibrated.

If an applicant wishes to calibrate his instruments, the following information shall be submitted:

A. The type (radioisotope, manufacturer, and model number) and activity of the calibration source to be used.

B. The specific procedures to be used for calibration, including radiation safety procedures to be followed for use of the calibration source.

C. The name and pertinent experience of each individual who will perform instrument calibration.

If instrument calibrations will be performed by a service organization or individual, the applicant should submit the name and address of the organization or individual and the frequency of calibration.

Item 12: Personnel Monitoring Equipment

The licensee or registrant may not permit any individual to act as a radiographer or a radiographer's assistant unless, at all times during radiographic operations, each individual wears, on the trunk of the body, a combination of a direct-reading dosimeter, an operating alarm ratemeter, and an individual monitoring device that is processed and evaluated by an accredited national voluntary laboratory accreditation program (NVLAP) processor. At permanent radiography installations where other appropriate alarming or warning devices are in routine use, the wearing of an alarming rate-meter is not required. The frequency of exchange of dosimeters shall be specified and will generally be monthly.

The manufacturer, and model number of pocket dosimeters to be used shall be identified. The dosimeter must have a range of zero to two hundred milliroentgens. The frequency of dosimeter calibration and how dosimeters will be calibrated shall be specified. The maximum frequency for dosimeter calibration is yearly.

The manufacturer, and model number of alarming ratemeters to be used shall be identified. The ratemeter must be checked, without being exposed to radiation, to ensure that the alarm functions properly (sounds) before using at the start of each shift; be set to give an alarm signal at a preset dose rate of five mSv per hour [500 mrem per hour] with an accuracy of plus or minus twenty percent of the true radiation dose rate; require special means to change the preset alarm function; and be calibrated at periods not to exceed twelve months for correct response to radiation. The licensee shall maintain records of alarm ratemeter calibrations for three years from the date of calibration.

Item 13: Description of Radiographic Facilities

If a permanent, shielded facility will be used for performance of radiography, a detailed description of the facility must be submitted which includes the following:

A. Annotated drawing or sketches of the facility and its surrounding, including (a) dimensions of each enclosed area, (b) thickness, density, and type of shielding material on all sides, above, and below each exposure area.

B. A description of the area security safeguards, such as locks, signs, warning lights, and interlocking systems for each enclosed exposure area and adjacent areas.

C. The results of calculations or radiation level measurements showing maximum anticipated radiation levels in all areas adjacent to each exposure area including the roof or ceiling. As a basis for calculations, the type of source, quantity of activity in the source, and position of the source within the facility should be identified.

D. A description of the visible and audible signal system and its location. The visible signal must be activated by radiation whenever the source is exposed. The audible system must be activated when an attempt is made to enter the installation while the source is exposed.

The objective of a shielded facility is to permit performance of radiography within the facility so that areas outside the facility may be considered unrestricted areas and will meet the radiation level limitations in subsection 33-10-04-02.5 of the rules. A radiation level of not more than 2 milliroentgens per hour at a distance of 18 inches from any external surface of the facility will be considered acceptable for considering the area as an unrestricted area.

Item 14: Radiation Protection Program

A. Operating and Emergency Procedures

Subsection 33-10-05-05.3 of the rules requires each licensee to provide radiography personnel with operating and emergency procedures. The purpose of these procedures is to provide radiography personnel with clear and specific instructions in the topics in subsection 33-10-05-05.4 and other duties and responsibilities which radiography personnel may have. Other duties could include instrument calibration, leak testing, quarterly inspection and preventive maintenance of equipment, and shipment of sources and devices. The operating and emergency procedures for personnel should not contain information which does not apply specifically to the duties of radiography personnel; for example, training program description, management control program, etc.

The operating and emergency procedures shall be tailored to fit the program proposed in the application. The procedures and instructions shall be complete and self-contained in a single document. Information contained in equipment manuals and other publications shall be extracted and placed into the operating and emergency procedures, so that the instructions to personnel are clear, specific, and appropriate for the proposed program. The instructions contained in the operating and emergency procedures should be in language which can be easily understood by radiography personnel.

There is no specific format for operating and emergency procedures. A sequential set of instructions which covers radiography operations from the beginning of the work day to the end of the work day is an acceptable format.

The following comments may be helpful with respect to the topics which must be included in the operating and emergency procedures.

1. The Handling and Use of Licensed Sealed Sources and Radiographic Exposure Devices

Step-by-step instructions of the "cookbook" type for the use and handling of radiographic exposure devices and related equipment shall be provided. When appropriate, the procedures shall include instructions for use of radiation collimating cones or their auxiliary shielding material.

If the source exchange will be performed by radiography personnel, step-by-step instructions for the source exchange, including surveys to be performed during the source exchange and for shipment, shall be provided. Acceptable radiation levels for the surveys should be in the procedures.

2. Methods and Occasions for Conducting Radiation Surveys

The procedures must identify when surveys shall be made, specifically what should be surveyed, and acceptable radiation levels for the surveys.

In general, a survey shall be performed each time a source is manipulated or moved. Surveys which need to be performed include:

a) After each exposure to determine that the source has been returned to the safe storage position. This survey shall include both the guide tube, if appropriate, and the device itself.

b) Determination of the perimeter of the restricted area.

c) Determination of radiation levels at external surfaces of storage facilities.

d) In and around vehicles used for transporting sources and devices.

e) Prior to securing a radiographic exposure device, storage container, or source exchanger.

f) Determination that containers prepared for shipment comply with the requirements in the Department of Transportation regulations (10 mr/hr at 1 meter from any surface and 200 mr/hr at the surface of the container).

The acceptable radiation levels for surveys shall be expressed in milliroentgens per hour. Radiation levels shall not be expressed in terms of potential dose.

3. Methods for Controlling Access to Radiographic Areas

The instructions for control of access to permanently established facilities must be separate and distinct from the instructions for temporary site operations.

The perimeter of the restricted area and the perimeter of the high radiation area need to be posted. "Caution (or Danger) - Radiation Area" signs must be posted at the perimeter of the restricted area and "Caution (or Danger) - High Radiation Area" must be posted at the perimeter of the high radiation area. The use of high radiation area signs are not acceptable for the perimeter of the restricted area; these signs shall be used only at the perimeter of the high radiation area.

Signs, by themselves, do not provide an adequate means of access control. For radiographic operations performed outside of a permanently established, shielded facility, instructions requiring surveillance of the area to prevent unauthorized persons from entering the area are necessary. For permanently established facilities, specific instructions concerning use of interlocking devices and systems, locking of the facility, security of key, use of warning lights, etc. shall be included in the procedures.

A specification of a radiation level of 2 milliroentgens per hour for the perimeter of the restricted area and 100 milliroentgens per hour for the perimeter of the high radiation area is acceptable. A physical survey with a survey meter must be performed to confirm the 2 milliroentgens per hour radiation level for the restricted area after the source has been exposed. It is neither necessary nor desirable for a physical survey to be made to confirm the radiation level at the perimeter of the high radiation area since such a survey could lead to unnecessary exposure of personnel.

4. Methods and Occasions for Locking and Securing Radiographic Exposure Devices, Storage Containers, and Sealed Sources

There shall be an instruction which requires locking of the exposure device after completion of the survey to determine that the source has returned to the safe storage position.

Instruction and procedures for storage of sources and devices at both permanent and temporary job sites including posting of storage areas and surveys around the

storage areas shall be contained in the procedures. The area outside storage areas shall be considered an unrestricted area.

5. Personnel Monitoring and the Use of Personnel Monitoring Equipment

The instructions shall contain requirements for radiography personnel to wear their personnel monitoring devices so that any exposure received will be accurately reflected by the devices. The instructions shall be specific.

Personnel must be instructed that pocket dosimeters must be charged at the start of each workday. Frequent reading of pocket dosimeters shall be conducted so that personnel may be aware of exposure which they have received. An instruction concerning steps which must be taken immediately by radiography personnel in the event a dosimeter is found to be off-scale must be in the procedures.

Instructions for storage of personnel monitoring devices shall be in the procedures.

6. Transporting Sealed Sources to Field Locations, Securing Exposure Devices and Storage Containers in Vehicles, Posting of Vehicles, and Control of Sealed Sources During Transportation

The transport over public roads of radiography sources in exposure devices or storage containers is subject to the regulations of the Department of Transportation. These regulations cover, among other things, permissible radiation levels around and within a vehicle and placarding of the vehicle during transport. In those cases in which the Department of Transportation regulations are not applicable, such as intra-state transportation, Chapter 33-10-13 of the rules requires conformance to the standards and requirements of the Department of Transportation.

The procedures shall contain instructions as to how the exposure device or storage containers should be secured within the transporting vehicle to prevent shifting within the vehicle. There shall be instructions for placarding of the vehicle during transport. The DOT regulations require "RADIOACTIVE" placards on all 4 sides of the vehicle if the package being transported requires a Radioactive Yellow III label.

There shall be instructions for surveys in and around the vehicles. For the passenger compartment and for any exterior surface of the vehicle, the radiation level shall not exceed 2 milliroentgens per hour.

When a vehicle is used for storage, posting requirements in subsection 33-10-04.1-13.2 of the rules are applicable, unless the exceptions listed in subsection 3 apply. A vehicle when used for storage should be posted with "Caution - Radioactive Material" signs. As noted above, the area outside a parked vehicle used for storage is an unrestricted area and the radiation level at the surface of the vehicle shall not exceed 2 milliroentgens per hour.

7. Minimizing Exposure of Persons in the Event of an Accident - Emergency Procedures

Instructions to personnel shall include procedures for minimization of exposure to persons in the event of an accident or other unusual occurrence. Possible malfunctions of equipment shall be considered and steps to follow in each case of malfunction shall be specifically set forth.

The procedures shall contain clear and specific instructions concerning emergency situations. The steps to be taken by radiography personnel shall, in general, be limited to (a) surveying the area, (b) establishing a restricted area, (c) notifying

appropriate persons, and (d) maintaining direct surveillance and control over the area until the situation is corrected. Limitations on action which may be taken by radiography personnel shall be clearly specified. The attempted recovery of a source that has become detached from an exposure device, an operation that may result in exposure to high levels of radiation, shall not normally be attempted by radiography personnel without qualified help.

8. The Procedure for Notifying Proper Persons in the Event of an Accident

The names and telephone numbers of the persons to be contacted shall be specified.

9. Record Keeping

The instructions to personnel shall specify those records which must be developed by them during the course of their work. Among those records which are normally made by radiography personnel are dosimeter readings, surveys, and daily inspection of equipment. Other records shall be included if they are the responsibility of radiography personnel. Records for which management and supervisory personnel have responsibility shall not be included in the operating and emergency procedures.

10. Inspection and Maintenance of Radiography Exposure Devices and Storage Containers

The procedure shall contain specific instructions for daily inspection of radiographic equipment prior to use on each day on which the equipment is used. A checklist must be contained in the procedures concerning the items which shall be covered in the daily inspection. Equipment manufacturers may be helpful in providing information concerning daily inspections.

Quarterly inspection and preventive maintenance of equipment must be carried out. If radiography personnel will conduct these inspections, clear and specific instructions for inspection and maintenance shall be in the procedures. As part of the inspection and preventive maintenance program, all connectors, drive cables, source guide tubes, on-off indicator mechanisms, and all moving parts shall be checked for defects and excessive wear. Cables shall be cleaned and lubricated and all defective and excessively worn components repaired or replaced. If components essential to the safe operation of the device are found to be defective, or in poor operating condition, the device must be immediately removed from service until repairs can be made.

Area safeguards used during radiographic operations in a shielded facility shall be tested for proper operation at least once every six months. The area safeguards may include door or equipment interlocks, audible or visible warning, or access door locking devices. Instructions for performance of such inspections shall be in the procedures if they are performed by radiography personnel.

B. Internal Inspection System or Other Management Control

The application shall include a description of the system for controlling the receipt, possession, and use of radioactive material. The system shall assure that license conditions, Department rules, and operating and emergency procedures are followed by radiographers and radiographer assistants.

Subdivision 33-10-03-05.3(a) of the rules requires that the license applicant submit a description of his internal inspection system or other management control. This shall include

a description of (1) the qualifications of each person responsible for maintaining such control, (2) the type of internal inspections to be made and their frequency, (3) the responsibilities of each person in the program, (4) the procedure for recording and reporting deficiencies to appropriate management personnel, and (5) the education and follow-up program to be utilized in correcting deficiencies noted during inspections. The type and extent of the radiography program to be conducted will usually determine the nature of the system and the inspection frequency.

Periodic (at least quarterly) inspections of radiography operations shall be made by a person of authority in management on both an announced and unannounced basis. This person should have a thorough knowledge of equipment, procedures and rules, and a level of competency at or above that expected of a radiographer. Management should make a continuing review of quarterly inventories, utilization logs, and records of receipt and disposal of licensed material, personnel monitoring results, and surveys.

C. Overall Organizational Structure

Active control over the radiography program must be exercised by management personnel in positions of authority. Subdivision 33-10-03-05.3(a) of the rules requires that the radiography applicant submit a description of the overall organizational structure pertaining to the radiography program, including specific delegations of authority and responsibility for the program.

Each individual in the line of authority shall be identified by name and his duties and responsibilities related to the radiography program should be described in detail. The training and experience of each individual which qualifies him to perform his duties and accept his responsibilities should also be described.

Those individuals in management who will be assigned duties established by the licensee for maintaining active management control of the program, shall be identified.

D. ALARA:

Ensuring that Occupational Radiation Exposures Are As Low As Is Reasonably Achievable (ALARA)

Describe the management policy and organizational structure related to ensuring that occupational radiation exposures are ALARA. Describe the applicable responsibilities and the related activities to be conducted by the individuals having responsibility for radiation protection. Indicate whether, and if so how, the guidance given in Regulatory Guide 8.10, "Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As Is Reasonably Achievable," will be followed; if it will not be followed, describe the specific alternative approaches to be used.

Please describe special measures that will be undertaken to limit exposure for female employees of child-bearing ages.

The application should contain a commitment by the applicant that all safety-related operations will be conducted in conformance with detailed written procedures. A detailed description of the procedures should be provided.

E. Leak Testing Procedures

Distributors of sealed sources usually supply a certificate with each source giving the results and date of the last leak test performed on a source. If such a certificate is not received, the source is not to be used until a leak test has been performed and the results of the test received showing that the source is not leaking or contaminated. Thereafter, the source must

be tested for leakage and contamination at intervals not to exceed six months. Records of the testing of each source, identifying the source tested, date of the test, and the results of the test in units of microcuries, must be maintained for Department inspection.

The leak testing of sealed sources may be performed only by persons who are specifically authorized by the Department to do so. In establishing a program for leak testing, you may choose one of three approaches:

1. You may utilize the services of a consultant or commercial organization licensed by the Department to take the necessary test samples ("smears"), evaluate the samples and report the results to the customer. The name, address, and license number of the consultant or commercial organization shall be specified in your application.

2. You may be licensed by the Department to use a commercially available leak test kit. Your application shall specifically identify each kit you may wish to use by designating the kit supplier and the kit model number. Only those leak test kits which are specifically identified will be authorized.

   Your application shall identify by whom the leak test (using the kit) will be performed. If radiographic personnel will perform the leak test, specific instructions should be included in the operating and emergency procedures for personnel. The instructions and procedures provided by leak test kit suppliers should be modified to fit your program. For example, many kit procedures indicate that the manufacturer of the source shall be notified if a survey of the leak test sample indicates a potentially leaking source. Instructions to radiographic personnel should indicate that management should be informed since dealing with suppliers is usually a management function.

3. You may be licensed by the Department to perform your own leak tests, including taking and evaluating the smears.

   Should you desire to conduct your own leak tests, you shall submit the information required by Subdivision 33-10-03-05.3(a) of the rules. This shall include a description of the instrumentation to be used in evaluating the smear, including its sensitivity and accuracy, and a description of your calibrating and standardizing procedures, with a sample calculation showing conversion of results to the required microcurie units. Survey instruments are generally not designed for such measurements and may not be acceptable for this use. A description of the material to be used in taking the smear, the points on the equipment which will be smeared (smears are not normally taken directly from the surface of a source -- see subsection 33-10-05-04.6 of the rules), the radiation safety procedures to be followed during the smearing process, the method for handling and disposing of the smears and the training and experience of each person who will take or evaluate the smears which qualifies him for each task shall also be included. If radiographic personnel will perform the test, specific instructions shall be contained in the operating and emergency procedures.

Item 15

Self-explanatory.

IV. AMENDMENT AND RENEWAL OF LICENSES

Applicants for amendment of existing licenses should be filed in the same manner as initial applications or may be filed in letter form. The application should clearly identify the license which is to be amended by license number. The exact nature of the requesting changes should be specified and additional supporting information, as necessary, should be provided.

Licenses are normally issued for a period of five years. If an application for license renewal is filed thirty days or more before license expiration, the existing license remains in effect until the new application has been finally acted upon by the Department.

Renewal applications should be filed using Form SFN 8418 and should contain complete and up-to-date information concerning the applicant's current program. References to previously submitted documents should be clear and specific and specify the document by date and indicate pertinent information by page and paragraph. There is no fee associated with the renewal process.

For an amendment to an existing license the fee is $190. The annual fee for an industrial radiography license is $3050 (or $1350 as a “small entity”), and must be paid by January 1 each year the license is active.

Fee payments shall be made by check, draft, or money order made payable to the North Dakota Department of Health.

NRC Licensing Guides in the NUREG-1556 series are also acceptable guides to use when preparing a license application for industrial radiography (NUREG-1556, Vol. 2).